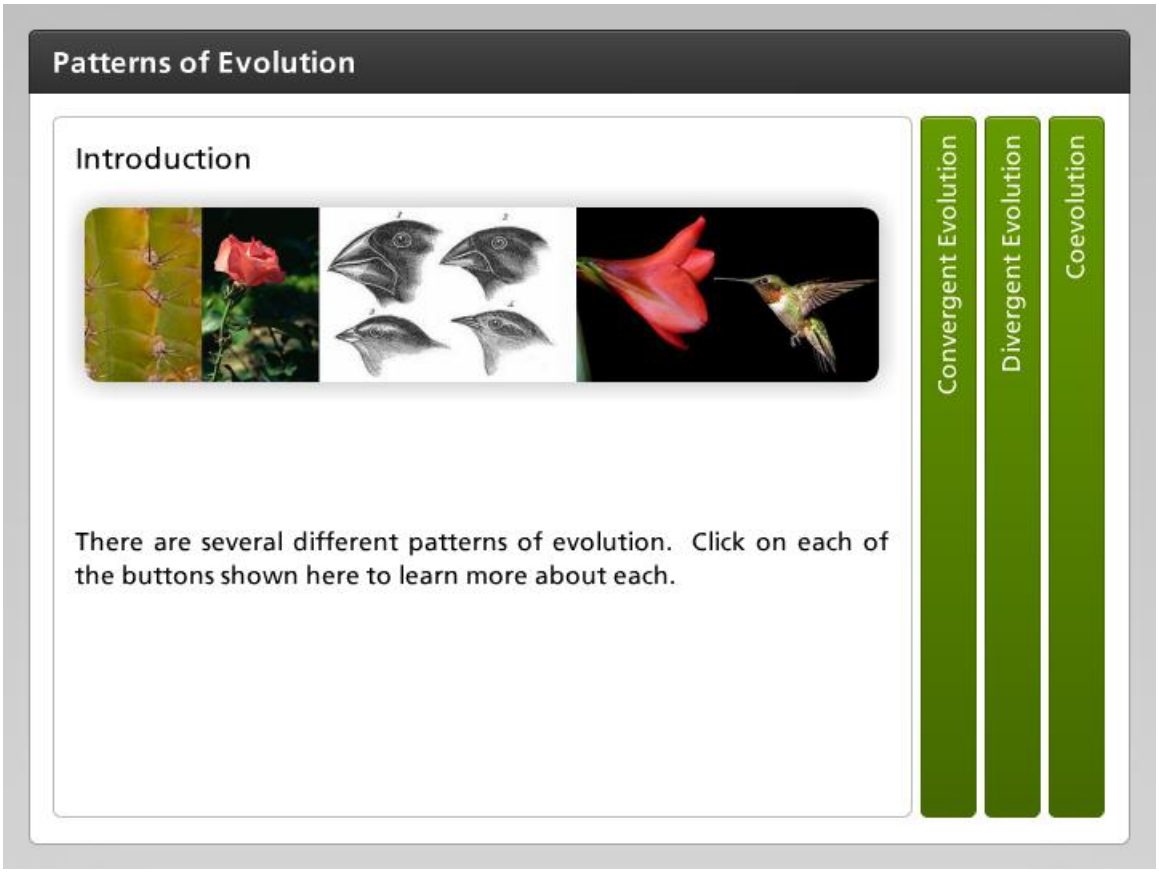
Module 8: Evolution and Natural Selection
Topic 3 Content: Patterns of Evolution Notes

Introduction



There are several different patterns of evolution. Click on each of the buttons shown here to learn more about each.

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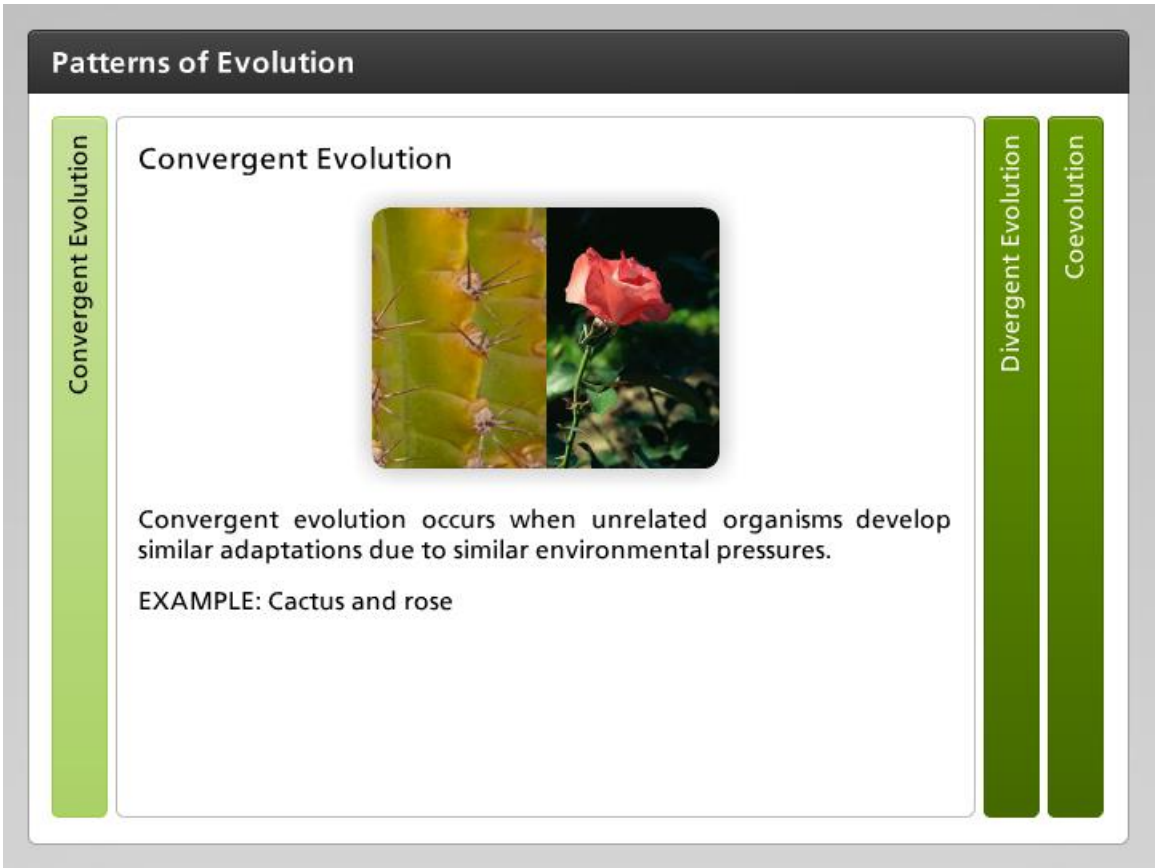
Convergent Evolution



Convergent evolution occurs when unrelated organisms develop similar adaptations due to similar environmental pressures.

An example of convergent evolution is the cactus and the rose. While these two plants differ greatly in their appearance, both have had to deal with a common environmental pressure: attack from other organisms that consume them as food sources. Scientists believe that both species independently adapted very sharp protrusions as a way to ward off predators. Roses adapted by developing an outer layer their stems into small, sharp prickles called thorns, while cacti adapted by forming long, slender spines.

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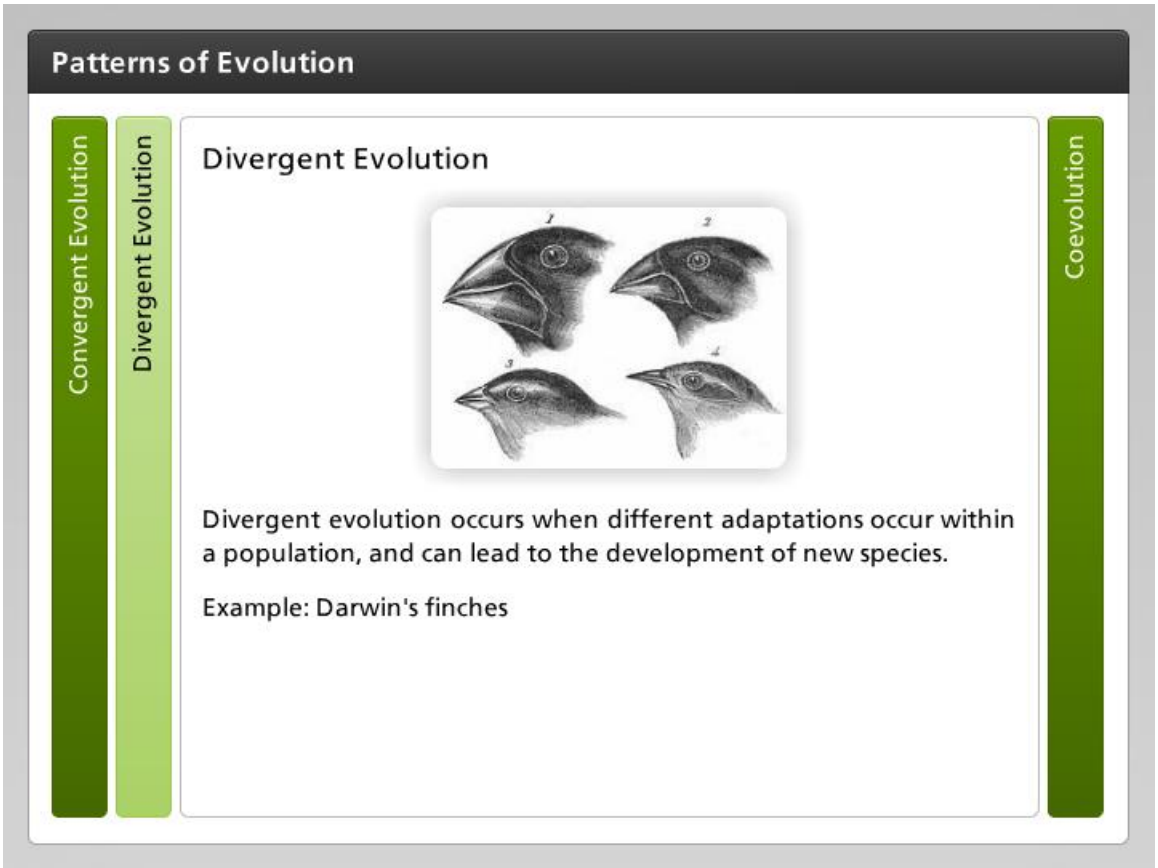
Divergent Evolution



Divergent evolution occurs when different adaptations occur within a population, and can lead to the development of new species.

Examples of species that resulted from divergent evolution are the finches that Charles Darwin studied on the Galapagos Islands. During his travels, Darwin recorded fourteen different species of finches on the islands, four of which are pictured here. If you examine their beaks, you will see differences in shape and size.

- The first bird, a large ground finch, has a large, heavy beak best for cracking hard shells.
- The second bird, a medium ground finch, eats a combination of insects and seeds.
- The third bird, a small tree finch, eats insects.
- The fourth bird, a warbler finch, eats both flying and ground insects.

Darwin, as well as later scientists, reasoned that the Galapagos finches evolved from a common ancestor from the South American mainland in the not-so-distant past. The birds developed such distinctive adaptations to take advantage of food choices in their environment.

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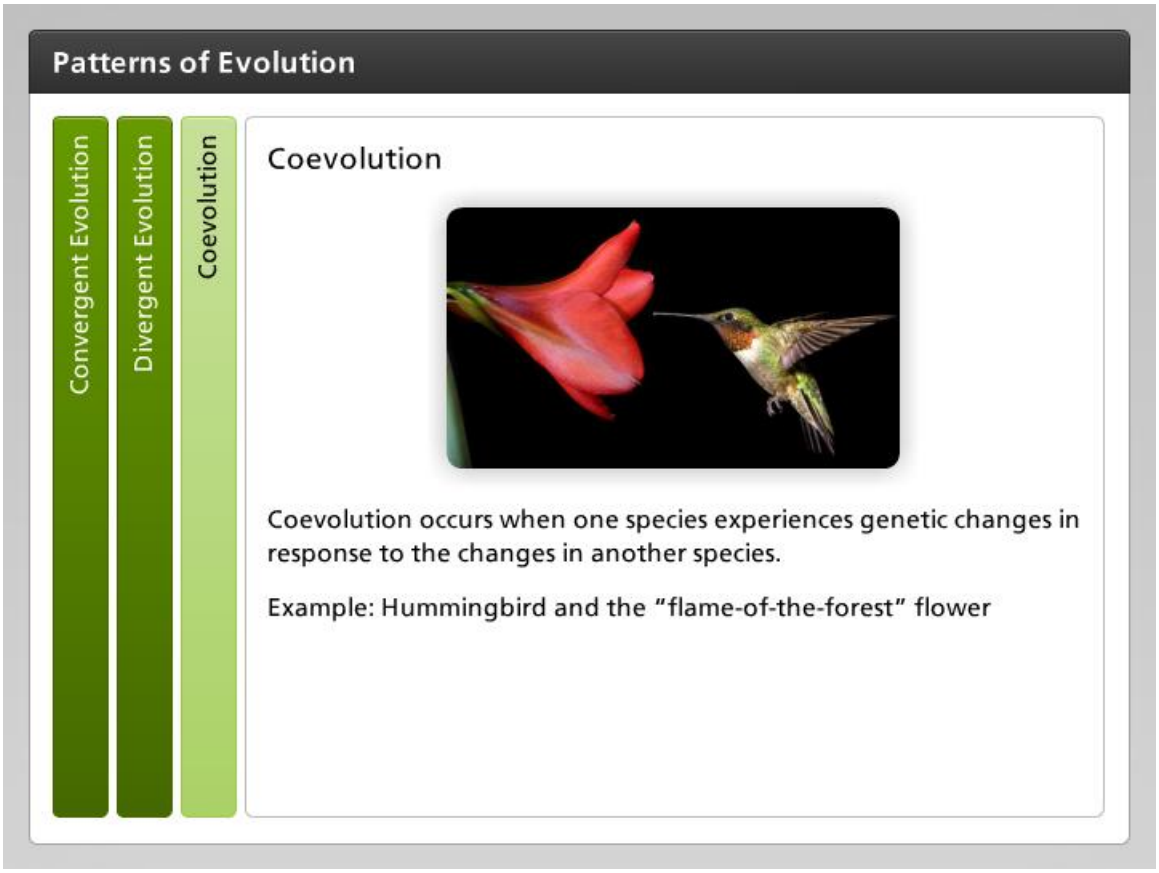
Coevolution



Coevolution occurs when one species experiences genetic changes in response to the changes in another species.

An example of coevolution is the hummingbird and the flowering plant known as the "flame-of-the-forest." Hummingbirds drink nectar from flame-of-the-forest flowers as a food source, and the flame-of-the-forest flower needs birds, like hummingbirds, to carry pollen from one flower to another flower in order to reproduce. Because of this special relationship, these plants have adapted to have large quantities of nectar held in long, thin tubes near their reproductive structures, while the hummingbird has adapted a long, thin beak capable of accessing the nectar that the bird needs to survive.